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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/682,858	10/25/2001	Dale M. Brown	GLO 2 0068	9983
27885	7590	02/20/2004	EXAMINER	
FAY, SHARPE, FAGAN, MINNICH & MCKEE, LLP 1100 SUPERIOR AVENUE, SEVENTH FLOOR CLEVELAND, OH 44114			LEE, SHUN K	
		ART UNIT		PAPER NUMBER
				2878

DATE MAILED: 02/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/682,858	BROWN ET AL.
	Examiner	Art Unit
	Shun Lee	2878

-- The MAILING DATE of this communication appars on the cover sheet with the correspondance address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-21 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 25 October 2001 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 011702.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The papers filed on 17 January 2002 (certificate of mailing dated 29 November 2001) have not been made part of the permanent records of the United States Patent and Trademark Office (Office) for this application (37 CFR 1.52(a)) because of damage from the United States Postal Service irradiation process. The above-identified papers, however, were not so damaged as to preclude the USPTO from making a legible copy of such papers. Therefore, the Office has made a copy of these papers, substituted them for the originals in the file, and stamped that copy:

**COPY OF PAPERS
ORIGINALLY FILED**

If applicant wants to review the accuracy of the Office's copy of such papers, applicant may either inspect the application (37 CFR 1.14(d)) or may request a copy of the Office's records of such papers (i.e., a copy of the copy made by the Office) from the Office of Public Records for the fee specified in 37 CFR 1.19(b)(4). Please do **not** call the Technology Center's Customer Service Center to inquiry about the completeness or accuracy of Office's copy of the above-identified papers, as the Technology Center's Customer Service Center will **not** be able to provide this service.

If applicant does not consider the Office's copy of such papers to be accurate, applicant must provide a copy of the above-identified papers (except for any U.S. or foreign patent documents submitted with the above-identified papers) with a statement that such copy is a complete and accurate copy of the originally submitted documents.

If applicant provides such a copy of the above-identified papers and statement within **THREE MONTHS** of the mail date of this Office action, the Office will add the original mailroom date and use the copy provided by applicant as the permanent Office record of the above-identified papers in place of the copy made by the Office. Otherwise, the Office's copy will be used as the permanent Office record of the above-identified papers (*i.e.*, the Office will use the copy of the above-identified papers made by the Office for examination and all other purposes). This three-month period is not extendable.

Specification

2. The disclosure is objected to because of the following informalities:

- (a) “ $\geq ^\circ C$ ” in [0012];
- (b) “3 wavelengths” and “25 wavelengths” in [0018]; and
- (c) “3 wavelengths” and “25 wavelengths” in [0037].

Appropriate correction is required.

Claim Objections

3. Claims 1, 10-12, and 14 are objected to because of the following informalities:

- (a) in claim 1, “the current” on line 8 should probably be --the photo current-- and “a current” on line 4 should probably be --a photo current-- (to avoid confusion with “a low dark current” on line 4 of claim 1);
- (b) in claim 10, “the current” on line 2 should probably be --the photo current-- (to avoid confusion with “a low dark current” on line 4 of claim 1);
- (c) in claim 11, “the current” on line 1 should probably be --the photo current-- (to avoid confusion with “a low dark current” on line 4 of claim 1);

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(d) in claim 12, "the current" on lines 7 and 9-10 should probably be --the photo current-- and "a current" on line 7 should probably be --a photo current-- (to avoid confusion with "a low dark current" on line 6); and

(e) in claim 14, "the current" on line 1 should probably be --the photo current-- (to avoid confusion with "a low dark current" on line 6 of claim 12).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. Claims 4, 13, and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "3 wavelengths" in line 3 and "25 wavelengths" in lines 6-7, claim 13 recites the limitation "3 wavelengths" in line 4 and "25 wavelengths" in line 6, and claim 18 recites the limitation "3 wavelengths" in line 4 and "25 wavelengths" in lines 6-7 which is vague and indefinite since the length of a wavelength is unclear.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-3, 5, 8-12, 14-17, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edmond *et al.* (US 5,093,576) in view of Martin (US 3,982,713) and Bushman (US 5,430,448).

In regard to claim 1, Edmond *et al.* disclose a detector, comprising:

- (a) a filter (column 10, lines 48-57) for substantially blocking photons having wavelengths of greater than about 290 nm (*i.e.*, about 250 nm); and
- (b) a photodiode (column 9, lines 12-26) having a low dark current (column 6, lines 38-44), a current from the photodiode being proportional to a quantity of photons having wavelengths of less than or equal to about 250 nm, which pass through the filter and impinge the photodiode (column 2, line 40 to column 3, line 57).

While Edmond *et al.* also disclose (column 2, lines 3-15) that the detector is used in military applications such as identifying missiles by the missiles' characteristic combustion processes used for propulsion, the detector of Edmond *et al.* lacks an explicit description of a processor for determining the quantity of photons impinging the photodiode as a function of the current. However, missile tracking with UV detectors is well known in the art. For example, Martin teaches (column 5, line 16 to column 6, line

61) a computer is provided in order to process and analyze the signal outputted by the detector. As another example, Bushman teaches (column 3, lines 4-68) an analyzer (*i.e.*, processor) is provided in order to process and analyze the signal outputted by the detector. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a processor in the detector of Edmond *et al.*, in order to process and analyze (e.g., determining the quantity of photons impinging the photodiode from) the signal outputted by the detector.

In regard to claim 2 which is dependent on claim 1, Edmond *et al.* also disclose (column 5, line 66 to column 6, line 7) that the photodiode has a bandgap of greater than or equal to about 2.7 eV.

In regard to claim 3 which is dependent on claim 2, Edmond *et al.* also disclose (column 5, line 66 to column 6, line 7) that the photodiode is an SiC photodiode.

In regard to claim 5 which is dependent on claim 4, Edmond *et al.* also disclose (column 10, lines 48-57) that the filter is comprised of alternating layers of SiO₂ and Si₃N₄ (*i.e.*, a Rugate filter) as is known in the art.

In regard to claim 8 which is dependent on claim 1, Edmond *et al.* also disclose (column 2, lines 3-15) that the photons include photons from a combustion event.

In regard to claim 9 which is dependent on claim 8, Edmond *et al.* also disclose (column 2, lines 3-15) that the combustion event is a missile plume.

In regard to claims 10 and 11 which are dependent on claim 1, the detector of Edmond *et al.* lacks a signal conditioner including an amplifier for amplifying the analog current and an analog-to-digital converter for converting (*i.e.*, transforming) the analog

current to a digital signal transmitted to the processor. However, missile tracking with UV detectors is well known in the art. For example, Martin teaches (column 5, line 16 to column 6, line 61) to provide an amplifier and an analog-to-digital converter for transmitting the detector data to a computer in order to process and analyze the detector data. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a signal conditioner including an amplifier and an analog-to-digital converter in the detector of Edmond *et al.*, in order to transmitting the detector data to a computer for processing and analysis.

In regard to claims **12** and **14-16**, Edmond *et al.* in view of Martin and Bushman are applied as in claims 1 and 8-11 above. Edmond *et al.* also disclose (Figs 5 and 6) that the photodiode has a low dark current of less than about 0.4 pA/cm^2 .

In regard to claim **17**, Edmond *et al.* in view of Martin and Bushman are applied as in claims 1-3 above. Edmond *et al.* also disclose (column 2, lines 3-15) determining whether the object is present as a function of the quantity of the non-solar photons.

In regard to claim **21** which is dependent on claim 17, while Edmond *et al.* also disclose (column 2, lines 3-15) that the detector is used in military applications such as identifying missiles by the missiles' characteristic combustion processes used for propulsion, the system of Edmond *et al.* lacks that the processor tracks respective quantities of the non-solar photons at respective positions of the object and determines respective distances between a target and the object as a function of the positions. However, missile tracking with UV detectors is well known in the art. For example, Martin teaches (column 5, line 16 to column 6, line 61) a computer is provided in order

to process and analyze the signal outputted by the detector so as to track missiles. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a processor in the detector of Edmond *et al.*, in order to process and analyze (e.g., determining respective distances between a target and the object from) the signal outputted by the detector.

8. Claims 4, 13, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edmond *et al.* (US 5,093,576) in view of Martin (US 3,982,713) and Bushman (US 5,430,448) as applied to claims 1, 12, and 17 above, and further in view of Martin, Jr. *et al.* (US 4,663,557) and Wai *et al.* (US 6,083,341).

In regard to claim 4 (which is dependent on claim 1 in so far as understood), claim 13 (which is dependent on claim 12 in so far as understood), and claim 18 (which is dependent on claim 17 in so far as understood), while Edmond *et al.* also disclose (column 10, lines 48-57) a known (*i.e.*, Rugate) filter comprised of alternating layers of SiO₂ and Si₃N₄, the detector of Edmond *et al.* lacks an explicit description that the filter provides a rise characterized as from less than about 50% reflectance to more than about 97% reflectance within a range of less than about 3 wavelengths and a cutoff characterized as from greater than about 99% reflectance to less than about 50% reflectance within a range of less than about 25 wavelengths. However, Rugate (interference) filters are well known in the art. For example, Martin, Jr. *et al.* teach (column 2, lines 47-61) that an interference filter is designed to transmit in a preselected first wavelength region and reflect in an adjacent wavelength region (see Fig. 4). As another example, Wai *et al.* teach (column 1, lines 11-30) that an interference filter is

designed to block transmission at selected wavelengths (see Fig. 6a). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the SiO₂ and Si₃N₄ filter in the detector of Edmond *et al.* is designed to transmit in a preselected first wavelength region and reflect in an adjacent wavelength region (e.g., a rise from less than about 50% reflectance to more than about 97% reflectance within a preselected third wavelength range and a cutoff from greater than about 99% reflectance to less than about 50% reflectance within a preselected fourth wavelength range).

9. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edmond *et al.* (US 5,093,576) in view of Martin (US 3,982,713) and Bushman (US 5,430,448) as applied to claim 1 above, and further in view of Martin, Jr. *et al.* (US 4,663,557) and Greskovich *et al.* (US 4,379,110).

In regard to claims 6 and 7 which are dependent on claim 1, while Edmond *et al.* also disclose (column 10, lines 48-57) that the filter includes SiO₂ and Si₃N₄ (*i.e.*, inorganic material), the detector of Edmond *et al.* lacks an explicit description that the SiO₂ and Si₃N₄ are not degraded by temperatures greater than or equal to about 175°C. However, the properties of inorganic material such as SiO₂ and Si₃N₄ are well known in the art. For example, Martin, Jr. *et al.* teach (column 2, lines 47-61) that SiO₂ is not degraded by temperatures greater than or equal to about 175°C. As another example, Greskovich *et al.* teach (Fig.) that Si₃N₄ is not degraded by temperatures greater than or equal to about 175°C. Therefore it would have been obvious to one having ordinary

skill in the art at the time of the invention that the SiO₂ and Si₃N₄ filter in the detector of Edmond *et al.* is not degraded by temperatures greater than or equal to about 175°C.

10. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edmond *et al.* (US 5,093,576) in view of Martin (US 3,982,713), Bushman (US 5,430,448), Martin, Jr. *et al.* (US 4,663,557), and Wai *et al.* (US 6,083,341) as applied to claim 18 above, and further in view of Greskovich *et al.* (US 4,379,110).

In regard to claims **19** and **20** which are dependent on claim 18, Martin, Jr. *et al.* and Greskovich *et al.* are applied to claims 6 and 7 above.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Monday-Thursday.

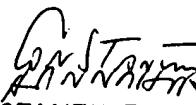
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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